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RANGELAND RESOURCES INTERNATIONAL, INC.

FIELD SEARCH FOR RARE PLANTS
IN THE RENO NEVADA ES AREA

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FINAL REPORT

FOR

FIELD SEARCH FOR RARE PLANTS
IN THE RENO NEVADA ES AREA

September 30, 1979

Presented to

Bureau of Land Management
Nevada State Offices
Reno, Nevada

by

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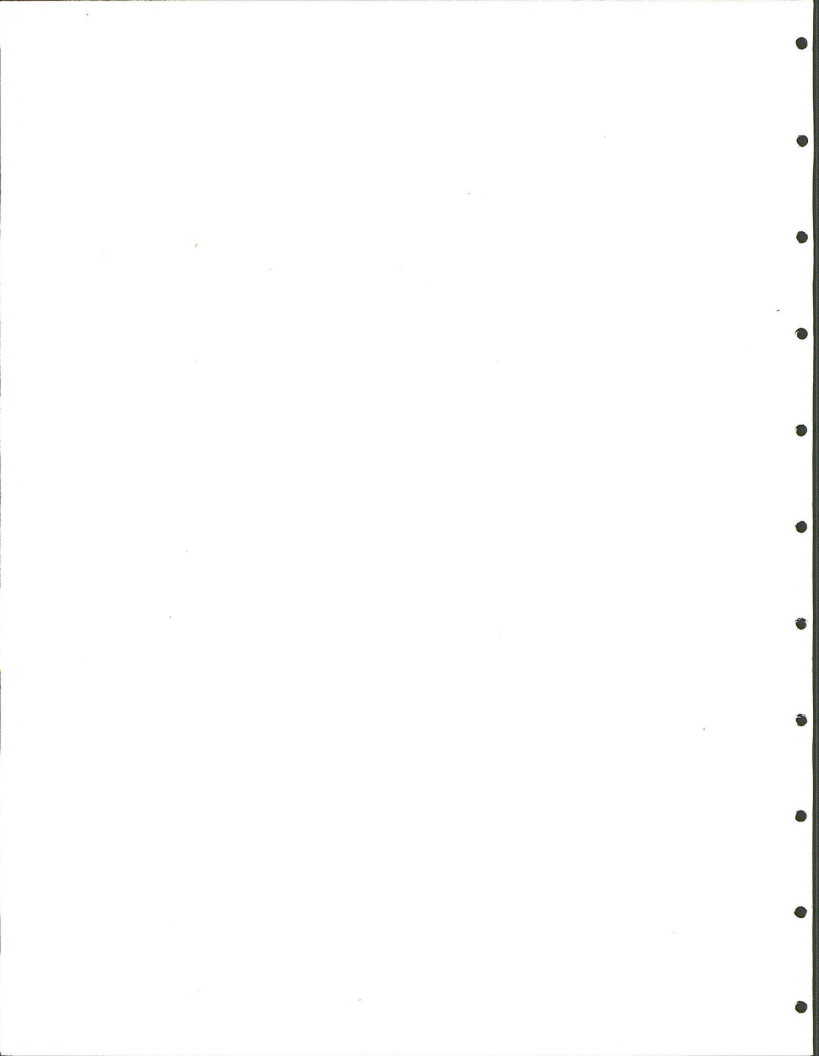
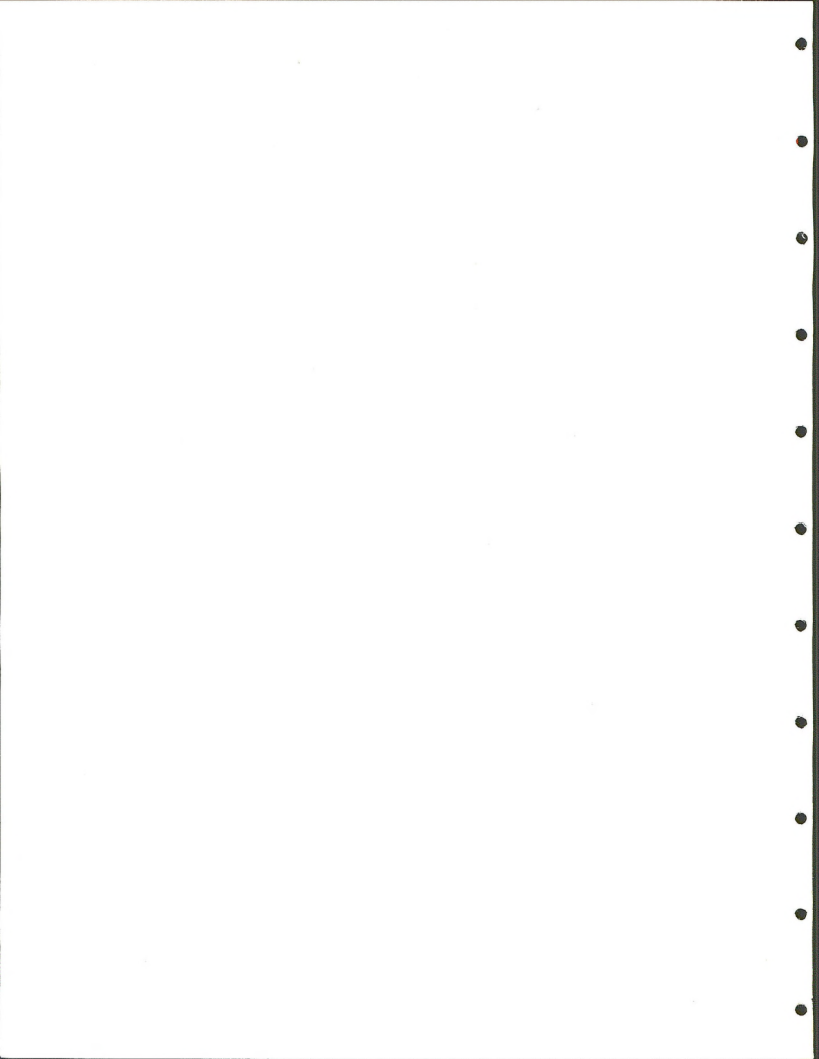


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INTRODUCTION

A study of threatened and endangered plants conducted by Rangeland Resources International, Inc., was designed to provide the Bureau of Land Management with floristic information for the Reno EIS Area. The minimum requirements of the study include a review of plant species listed on the Federal and State Endangered Species Registers as proposed threatened or endangered and a search of the area in an attempt to locate those particular species.

To accomplish these goals Rangeland Resources reviewed original and pertinent literature concerning those listed species as well as other botanically interesting species with possible occurrence in the area. This literature information was provided by the Bureau of Land Management. Herbaria having collections from the study area were visited and specimens of the species of interest were analyzed. From this beginning, the habitats, collection sites, growth characteristics, and identifying features for each species were obtained. Aerial photographs of the Reno EIS Area were available on a very limited basis from the BLM and were obtained when deemed necessary. Through the use of photo interpretation along with field reconnaissance, sites with potential habitat for the species of interest were identified. The subsequent ground searches were concentrated in those areas interpreted as possible habitats for unique plant species and particularly those listed as threatened or endangered.

As a result of this study, new floristic information has been obtained for the Reno ES Area. Some of the plants listed

on proposed Federal and State threatened and endangered species lists have been located. The study indicates that the status of some of the species should be changed.

Descriptions of the threatened or endangered species and collection information and discussion for these taxa are included with the text.

DESCRIPTION OF THE RENO ES AREA

THE AREA

The Reno ES Area includes land managed by the Bureau of Land Management from the Carson City District Office. These lands make up the Pyramid, Long Valley, Pine Nut, and Markleeville planning units. The study area roughly includes land that lies southwest and due south of Pyramid Lake, west of Fernley and Yerington, and east of the California border with the exception of those small parcels of federal land found in the Long Valley and Markleeville planning units. This study area includes portions of Washoe, Storey, Douglas, Carson City, and Lyon counties in Nevada and Alpine, Lassen, Plumas, and Sierra counties in California. Scattered tracts of public domain are found mixed with private land, national forest, Indian Reservation, and Indian trust allotments. The total area includes approximately 1,081,000 acres but less than half of the land included within the study area boundary is actually public domain and it tends to be somewhat concentrated in small pockets. A small part of the study area is checkerboard land.

THE ENVIRONMENT

The Reno ES Area lies on the extreme western edge of the Great Basin within the Basin and Range Physiographic Province and consists of north-south trending mountains separated by small valleys. The area is bounded on the west by the eastern edge

of the Sierra Nevada Mountain range. A portion of this range falls into the study area but is found within national forest boundaries and on private land. Physiographically the study area consists of long valleys that drain into sinks or basin areas where the water either evaporates, forms lakes, or sinks into the ground. These areas usually lack drainage ways that lead to larger streams. Between these long valleys are mountain ranges or large, hilly areas. Between the valley bottoms and the mountainous or hilly terrain are extensive terraces and fans which form a foothill complex. Both the Carson and Truckee rivers cut through the study area. Elevation of the area ranges from 4,000 feet in the Honey Lake Valley in the northern part of the area to 9450 feet on Mt. Siegel in the southern part of the area. Relief between the mountains and adjoining valleys rarely exceeds 3000 feet.

The Reno ES Area is composed of both sedimentary and igneous strata. North of the Truckee River the area is primarily Tertiary volcanics with some areas of intrusive igneous rocks and some large deposits of Quaternary alluvium along with some Tertiary sedimentary rocks. With the exception of numerous small pockets of Mesozoic formations which outcrop in the southwestern end of the Virginia Range and in the Pine Nut Mountains, virtually all rocks in the study area date from Miocene to recent epochs. Below the Truckee River in the Virginia Range and in the Pine Nut Mountains there are inclusions of Tertiary nonmarine tuffaceous sedimentary rocks and numerous pockets of

Jurassic - Cretaceous volcanics in combination with Cretaceous nonmarine sedimentary rocks.

Major vegetation consists of riparian, salt desert shrub, cool desert shrub, pinyon-juniper woodland, mountain brush, western yellow pine forest and pockets of aspen. The latter three are somewhat restricted and are encountered infrequently in the study area. The bulk of the area consists of salt desert shrub and cool desert shrub with some heavy concentrations of pinyon-juniper woodland in the Pine Nut Mountains and in the Virginia Range. On the extreme western side of the area there is more yellow pine forest along with Douglas fir forests, Subalpine fir forest, alpine fellfields, and alpine meadows. These vegetation types are found in the Mount Rose-Lake Tahoe Region and are located on private or U S Forest Service land. These areas were not inventoried during the course of this study.

The climate of the Reno ES Area is semi-arid. Precipitation varies from 1 inch per year to as much as 20 inches per year. Twenty-two year averages from recording stations throughout the study area range from 3.5 to 11 inches per year. Precipitation varies greatly throughout the area due to the rainshadow effect of the Sierra Nevada and some of the lesser mountain ranges. Most of the annual precipitation comes in the fall and winter months with most of it falling as snow. Summers are generally hot and relatively dry. Temperatures tend to be extreme in this area with readings as low as 20 degrees below zero Fahrenheit in the winter and 105 degrees Fahrenheit in the summer. The mean

annual temperature is between 45 and 53 degrees (excluding the high mountain areas). Location and elevation greatly influence temperature and precipitation.

METHODOLOGY

LITERATURE REVIEW

In preparing for the review of literature and herbarium information for the Reno ES Area, a preliminary list of important plant taxa was established for the study area. This list served as a guide for beginning the review and remained subject to change according to data derived from the literature review. Plant taxa included in the preliminary list were obtained from the Federal Register of Threatened or Endangered Fauna or Flora Vol. 40 # 127,7-1-75 and Vol. 41 # 117,6-16-76 and from the Nevada State Threatened or Endangered Plant List as of 1978. The list included the following plant species which were thought to possibly occur on BLM land within the study area.

Abronia orbiculata Standley

Astragalus porrectus Wats.

Camissonia nevadensis (Kell.) Raven

Draba asterophora Payson var. asterophora

Draba douglasii Gray

Draba lemmonii Wats. var. incrassata Roll.

Draba stenoloba Ledeb. var. ramosa C.L. Hitchc.

Elodea nevadensis St. John

Eriogonum anemophilum Greene

Eriogonum lemmoni Wats.
Eriogonum lobbii T. & G. var. robustius
Haplopappus eximus Hall
Lupinus malacophyllus Greene
Lupinus montigenus Heller
Machaeranthera leucanthemifolia (Greene) Greene
Mimulus washoensis Edwin
Opuntia pulchella Engelm.
Oryctes nevadensis Wats.
Penstemon rubicundus Keck
Rorippa subumbellata Rollins
Trifolium andersonii Gray subsp. beatleyae Gillett
Trifolium lemmonii Wats.

Using this list as a guide, the herbarium at the Nevada State Museum in Carson City was visited in order to become more familiar with the plants of concern. By synthesizing all available information it was possible to determine when and where the initial emphasis would be placed. Utilizing information gathered from the literature and herbarium review, aerial photography and topographical maps were utilized on a limited basis in the selection of sites with high probability of containing habitats required for the species of concern.

The majority of the data and information concerning species of interest was supplied to Rangeland Resources by the Bureau of Land Management. No further literature or herbarium searches were required as part of this contract.

FIELD DATA COLLECTION

Actual field work for the study of threatened and endangered plants began October 2, 1978 and was completed by August 4, 1979. There were 8 weeks of field work on the project with one week in the fall of 1978 and seven weeks during the 1979 field season. Work periods were as follows:

October 1-7, 1978

April 29-May 5, 1979

May 27-June 9, 1979

June 17-30, 1979

July 22-August 4, 1979

Due to the time of the contract award (September 19, 1978) it was determined that it was too late in the year to justify more than one week in the field at that time. (Only one plant thought to occur in the area has been known to flower as late as September) Field collection was conducted throughout the 1979 growing season in order to obtain both early and late flowering species. Most of the study was conducted during the months of May and June because the majority of the plants are at their most identifiable stages of growth at that time. During the first trip to the study area in 1979 (April 29-May 5) there was significant snowfall and prolonged cold temperatures. At that time plant development was quite slow and the cold weather seemed to delay development even more. Following the cold weather the area experienced very hot dry weather and most of the annuals either died or did not flower. Many of the annuals were extremely

small or produced in small numbers only in the most optimum habitats. Many perennial species did not bloom in 1979.

Habitat Identification

Aerial photography was available from the Carson City District Office only on a very limited basis. Since all trips to the area were allocated strictly for field work and the photography was only available for use in the office the photographs were used only when deemed necessary. When utilizing the aerial photography, habitat information and exact location data obtained through the literature and herbarium review was compared to the information gained through photo interpretation. Sites matching or closely resembling those known to contain plant species of interest were located and then surveyed intensively. Field reconnaissance was the most useful tool in identifying suitable habitat areas. As the field crew became more familiar with the habitat requirements of each plant and with the study area as a whole, areas thought to contain threatened or endangered plants or at least suitable habitat for them were searched thoroughly. This technique proved to be more useful and practical than reliance upon the black and white photographs.

Plant Collection

To begin the field collection all those known or previously located populations of the proposed threatened or endangered plants were looked for and thoroughly searched when found. This was done in order to find out more about habitat requirements, development, population size and limits, and the status of each

population. All sites on public lands were characterized and located on maps. The habitat information was then used to select sites in the area with a high probability of containing the threatened and endangered plants. These sites were then studied intensively to determine whether or not the plant existed in that area. Crew members traversed the entire habitat area on foot making several passes through the areas of suitable habitat to ensure location of the species for which the search was being conducted. Suitable habitat areas were searched at different times during the field season to minimize the possibility of missing the species of interest at a phenological stage when the plant might be most inconspicuous. By concentrating on the sites where the plants would most probably occur, the whole study area could be searched most efficiently.

General Habitat Types Searched for and Associated Plant Species:

Stock tanks, ponds, and standing water	<u>Elodea nevadensis</u>
Talus slopes associated with mining areas	<u>Eriogonum lobbii</u> var. <u>robustius</u>
Coarse granite sands	<u>Mimulus washoensis</u>
	<u>Lupinus malacophyllus</u>
	<u>Camissonia nevadensis</u>
Desert washes and outwash fans	<u>Astragalus porrectus</u>
Clay flats	<u>Camissonia nevadensis</u>
Dry meadows	<u>Trifolium andersonii</u> ssp. <u>beateyae</u>
Alkaline sands	<u>Oryctes nevadensis</u>
Sandy rocky foothills	<u>Penstemon rubicundus</u>
Open sands	<u>Abronia orbiculata</u>
Loamy rocky flats and foothills	<u>Opuntia pulchella</u>
Lake deposits	<u>Eriogonum lemmonii</u>
Rocky ridge tops	<u>Draba douglasii</u>
	<u>Trifolium lemmonii</u>
Alpine fellfields	<u>Haplopappus eximus</u>

Granitic sandy lake
shore
Subalpine forest

Lupinus montigenus
Draba stenoloba var. ramosa
Draba asterophora var. asterophora
Draba lemmonii var. incrassata
Eriogonum anemophilum
Rorippa subumbellata
Haplopappus eximus
Lupinus montigenus
Eriogonum anemophilum
Draba stenoloba var. ramosa
Draba asterophora var. asterophora
Draba lemmonii var. incrassata

When a population of threatened or endangered plant was encountered the number of individuals was counted when practical and the status of the population established. If the plant was found in sufficient numbers and collection would not harm the population then a collection was made. Where possible, enough plant material was collected to produce two standard sized herbarium mounts.

As plant specimens were collected data for each was recorded in field record books. The data recorded includes:

- (1) Location (Township, range, section, quarter section, county, state, and distance and direction from the nearest post office)
- (2) Associated species.
- (3) Environmental data (elevation, soils, slope and exposure, habitat type, and geological formation)
- (4) Habitat condition (soil stability, size of the area, disturbance)
- (5) Collection data (collector, collection number, date of collection)

Photographs were taken of species proposed for inclusion on listings of threatened and endangered plants. Both 35mm color slide and color negative photographs were taken to include (1) closeup of individual taxa, (2) general view of habitat, and (3) a closeup of distinguishing characteristics.

As the populations of threatened or endangered plants were located, the area was surveyed intensively to determine the following:

- A. Size of the population
 - 1. number of individuals
 - 2. amount of suitable habitat that is inhabited
 - 3. size of the suitable habitat
- B. Status of the population
 - 1. reproduction
 - 2. disease
 - 3. livestock or wildlife damage by grazing or trampling
 - 4. insect damage
 - 5. rodent or small mammal damage
 - 6. off road vehicle damage
 - 7. damage due to logging, mining, road building, urban development
- C. Habitat requirements
 - 1. soil
 - 2. slope and exposure
 - 3. elevation
 - 4. associated species

- 5. relative precipitation or amount of moisture available
- 6. related geological formations
- D. Exact and proper plant identification
- E. Location on appropriate maps

Plant Identification

Identification of plant specimens was done in three stages. Plants were initially identified using the original descriptions contained in the literature search data or using flora keys that might be applicable. The plants were then checked against specimens found in the herbaria of the Nevada State Museum and Brigham Young University. Lastly, all identified specimens were examined by Dr. Stanley Welsh, senior taxonomist for verification.

Plant specimens were mounted on standard herbarium sheets and covered with clear plastic for protection.

ENDANGERED AND THREATENED PLANT SPECIES

Proposed endangered plant species known from the Reno ES Area are: Camissonia nevadensis, Machaeranthera leucanthemifolia, Eriogonum lemmonii, Astragalus porrectus, Trifolium lemmonii, and Trifolium andersonii ssp. beatleyae. Of these, Machaeranthera leucanthemifolia has been proposed for delisting by Holmgren.

Proposed endangered plant species known from areas adjacent to the Reno ES Area are: Elodea nevadensis, Eriogonum anemophilum, and Penstemon rubicundus. Elodea nevadensis is known only from Wadsworth and is thought to be extinct. Eriogonum anemophilum is known only from U.S. Forest Service land adjacent to the study area, and Penstemon rubicundus is known from the mountains near Hawthorne but does occur at Holbrook Junction adjacent to the study area.

Plant species reviewed as threatened that were cited as occurring in the Reno ES Area include: Eriogonum lobbii var. robustus, Draba douglasii, Lupinus malacophyllus, Mimulus washoensis, and Opuntia pulcella.

Plant species cited as threatened from Toiyabe National Forest adjacent to the study area include: Lupinus montigenus, Draba stenoloba var. ramosa, Rorippa subumbellata, Draba lemmonii var. incompressa, Draba asterophora var. asterophora, Haplobappus eximus, Oryctes nevadensis, and Abronia orbiculata. Oryctes nevadensis and Abronia orbiculata have both been located on the Pyramid Lake Indian Reservation but are not reported from within the study area.

RESULTS

The main purpose of this study was to determine and document the presence or absence of those threatened, endangered or rare plants listed by proposed federal and state lists and suspected of occurring within the boundaries of the Reno ES Area. As a result of the 1979 field search, Rangeland Resources located 9 of these species. These include: Camissonia nevadensis, Draba douglasii, Eriogonum lemmonii, Eriogonum lobbii var. robustius, Lupinus malacophyllus, Mimulus washoensis, Opuntia pulcella, Penstemon rubicundus, and Trifolium lemmonii.

There is a large group of the plants listed for this specific portion of Nevada which would not be expected to occur in and in fact have not been located in the Reno ES Area. These plant species have specific habitat requirements that are not duplicated on BLM land and occur in this area only because of the eastern edge of the Sierra Nevada Mountains which include Mt. Rose and Lake Tahoe. These plants are high altitude endemics found in vegetation types that do not occur in the mountain ranges within the BLM administered lands. The taxa in this group include: Eriogonum anemophilum, Haplopappus eximus, Rorippa subumbellata, Draba lemmonii var. incompressa, Draba asterophora var. asterophora, Draba stenoloba var. ramosa, and Lupinus montigenus. Due to the fact that only BLM land was to be searched intensively, these plants were not looked for at

their known locations which occur on National Forest and private lands. These plants were, however, searched for in the high altitude (over 8000 feet) areas within the study area. None of these particular species were located within the land administered by the BLM.

Abronia orbiculata, Elodea nevadensis and Oryctes nevadensis are reported from the Pyramid Lake Indian Reservation adjacent to the designated study area. Because of their proximity to the area they were included on the list and were searched for intensively. These plants were not located in the study area. Elodea nevadensis is thought to be extinct and there is considerable doubt as to whether it is a valid taxonomic entity. It appears to be a minor variant of Elodea canadensis a very common species found in the area. Abronia orbiculata has been recommended for deletion from proposed threatened or endangered species lists due to recent taxonomic research (Galloway, 1975) that indicates that it should be included in Abronia turbinata, the most common species of Abronia in Nevada.

Penstemon rubicundus although not collected within the study area was located within two miles of the boundary near Holbrook Junction on Highway 395. A search of suitable habitat within the study area in the proximity of this collection site was conducted without yielding additional populations.

Three of the listed species not collected in 1979 by the field crew have been previously reported from within the study area. Both reported sites and suitable habitats were extensively

searched. These were Astragalus porrectus, Machaeranthera leucanthemifolia, and Trifolium andersonii ssp. beatleyae.

Machaeranthera leucanthemifolia has been found only once in the study area and that was at Genoa. No other information was listed with that collection and it is possible that the plant was collected within Toiyabe National Forest near Genoa. All other collection information seems to indicate that this plant is found most often in more heavily forested areas although its habitat requirements seem to be highly variable. There also seems to be some questions about the taxonomic identity of this plant. It is generally believed that if Machaeranthera leucanthemifolia is a valid species then it is so only at the type location near Candellaria in Mineral County. All other specimens are thought to be minor variations of Machaeranthera canescens a very common and widespread species. This species needs taxonomic clarification and has been proposed for delisting by Holmgren.

Astragalus porrectus has been located at two separate locations within the study area, but was not located by Rangeland Resources during 1979 field season. Both known locations were searched thoroughly but the species was not relocated at either site. Other suitable habitat areas were carefully searched but no plants were found.

Trifolium andersonii ssp. beatleyae is known from two previously located populations within the Reno ES Area. Both areas were searched thoroughly and this taxon was located at

neither site during 1979. At one of the sites in the exact area where the plant had been collected earlier a population of Trifolium andersonii was located. It was determined however, after careful analysis by Dr. Stanley Welsh at Brigham Young University that the plant located was not the ssp. beatleyae but was probably ssp. monoense. It appears that the original collection of ssp. beatleyae at this particular site may be a case of misidentification. The specimen collected by Rangeland Resources was checked against verified specimens on file in the herbarium of Brigham Young University and its identity is definitely ssp. monoense.

Of the proposed threatened or endangered plants that were located by the field crew all of them with the exception of Eriogonum lemmonii were found on sites within the study area where they had not been previously recorded. Eriogonum lemmonii was found at three new locations but all occur just outside the boundaries of the Reno ES Area.

Of the species of interest that were located in the study area, the data derived from this study seems to indicate that Camissonia nevadensis, Draba douglasii, Eriogonum lobbi var. robustus, Lupinus malacophyllus, Mimulus washoensis, and Opuntia pulchella should be and most probably will be deleted from proposed threatened or endangered listings in the future and therefore require no special management considerations at this time. Astragalus porrectus, Eriogonum lemmonii, Trifolium andersonii ssp. beatleyae and Trifolium lemmonii are therefore the only species found within BLM lands in the Reno ES Area that will require extra attention. All of these plants are currently proposed endangered. Oryctes nevadensis and Penstemon rubicundus should also be considered for extra attention even though they have not been located in the study area. Both have been located less than two miles from the study area.

A full description and discussion for all species of primary concern is given in the following species summaries.

Astragalus porrectus Wats. in King Geol. Expl. 40th Par. 5:75 1871

Common name: Lahontan milkvetch

Description: Perennial, subglabrous; stems ascending, simple, 1-2' long; stipules large and membranous, at least the lower ones sheathing; leaflets 4-6 pairs, $\frac{1}{2}$ " in diameter, broadly obovate, retuse or obtuse; racemes loosely rather many-flowered, elongating in fruit; flowers $\frac{1}{2}$ long, yellow, spreading, the campanulate calyx-tube scarcely longer than the subulate teeth; legume $\frac{1}{2}$ - $3/4$ " long, chartaceous, flat, glabrous, oblong, gibbous dorsally, the ventral suture nearly straight, erect upon a spreading pedicel and stipe that exceeds the calyx, perfectly 1-celled, about 10-seeded.

*Flowering time May-June

Location: Washoe Co., Pyramid Planning Unit,

Habitat: Gravelly washes and outwash fans in foothills of mountains at 5600 feet.

Vegetation Type: variable

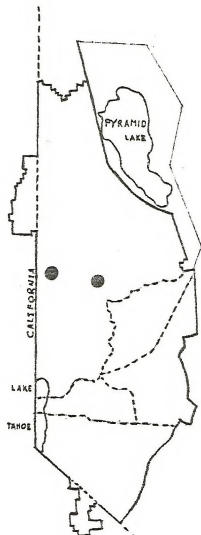
Geology: Quaternary alluvium from Pleistocene Lake Lahontan

Condition: Unknown

Population observations: Not available

Land ownership: BLM and private

Status: Reviewed as endangered (Federal Register 1975); proposed as endangered (Federal Register 1976); Recommended as endangered.



Astragalus porrectus is probably the rarest plant identified in the Reno, ES Area even though suitable habitat is very common. This plant is found in hot gravelly washes and outwash fans in the foothills of desert mountains and is known primarily from the Trinity and West Humbolt Mountains. It is also listed for the lower Humbolt and Truckee Valleys along the bed of Pleistocene Lake Lahontan. This plant was not encountered in the study area in 1979. It has been reported from the foothills on the south side of Peavine Peak and from the foothills northeast of Sparks.

Critical habitat for Astragalus porrectus is difficult to designate for the Reno ES Area because both known locations of the plant are on private land and no populations have been located on lands administered by the Bureau of Land Management. There is no evidence of damage to this species due to livestock grazing and the plant is unpalatable and would even be poisonous to livestock. Brush plowing, chaining, reseeding, and burning would have no harmful effects on this species. Because of its habitat (rocky outwash fans and wash bottoms in mountain foothills) this plant would not be affected by other management treatments simply because its habitat would not be treated under normal conditions. Aerial application of herbicides could cause some problems, however.

Astragalus porrectus was searched for intensively in wash areas and in the foothills of all the mountain ranges in the northern half of the study area. The area around Peavine Peak and the Virginia Mountains were searched most thoroughly but no specimens were found.

This plant has been reviewed as proposed endangered and due to the data generated by this study it is felt that it should retain that status at least until more information shows otherwise. Urban expansion is the greatest threat in the Reno area and it is a legitimate threat due to increased building in all foothills around Reno and Sparks and due to the lack of BLM land in those areas where the plant has been found. There is however a considerable amount of suitable habitat in the Reno ES Area and this plant could be expected anywhere in the area particularly in the northern half.

Camissonia nevadensis (Kell.) Raven, Brittonia 16:285, 1964
(Oenothera nevadensis Kell., Proc. Calif. Acad. 2:2244, 1863).

Common name: Lahontan primrose

Description: Erect, densely flowering from the base, the central stem 1-5 cm tall, the larger individuals with slender decumbent branches to 18 cm. long radiating from near the base of the plant, these naked below and with a dense tuft of leaves and flowers at the ascending end; plants subglabrous, the inflorescence strigulose. Leaves oblanceolate or narrowly oblanceolate, the blades 1-3.5 cm. long, 2-7 mm. wide, entire, acuminate at the apex, attenuate at the base; petioles 1-3 cm. long. Inflorescence erect. Hypanthium 2.2-3.2 mm. long, 1.2-1.3 mm. across at the summit, glabrous within. Sepals 3.2-3.5 cm. long, 1-1.1 mm. wide. Petals 3-5 mm. long, 2.2-4.2 mm. wide. Filaments of the epipetalous ones 3-4 mm. long; anthers 0.4-1.5 mm. long. Style 6-7 mm. long; glabrous; stigma 0.5-0.8 mm. thick, held somewhat above the anthers at anthesis. Capsule highly contorted, 0.8-1.4 cm. long, 1-2 mm. thick near the base, quadrangular in transection, tapering strongly from the swollen base, with a prominent pale brown midrib running down the center of each valve, held on the dead plant and shedding seeds very tardily. Seeds monomorphic, 1.2-1.5 mm. long, 0.3-0.4 mm. thick, gray, finely lacunose, much distorted by the walls of the capsule.

*Flowering time: April-June

Location: Washoe Co., Pyramid Planning Unit, Hungry Valley, T22N, R20E, Sec. 32, 33, 28, 21; T21N, R20E, Sec. 4 & 5, north of radio tower near Hungry Spring.

Habitat: Vernally moist clay flats, also sandy granitic soils at 5000 feet.

Vegetation type: Variable

Geology: Quaternary alluvium

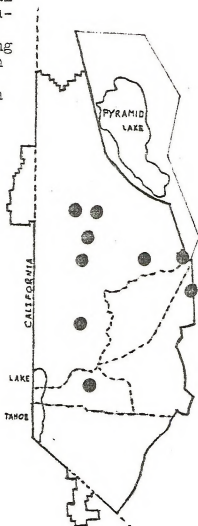
Condition: Stable yet highly variable from year to year.

Population observations: The populations consist of several hundred individuals in all sites located.

General distribution: Carson City, Churchill, Lyon, Storey and Washoe Counties in Nevada.

Land Ownership: BLM

Status: Reviewed as endangered (Federal Register 1975); proposed as endangered (Federal Register 1976); recommended for delisting. The total range of the species is large, and the plant is abundant within the populations. The plant is however an annual and is subject to extreme population fluctuations from year to year. The biggest threat to its existence is increased housing development north of Reno and Sparks and in the Carson City area. This plant should possibly be relisted as threatened if urban expansion continues.



Camissonia nevadensis is the most wide-spread of the proposed threatened or endangered plant species in the Reno ES Area. This plant has been collected from south of Carson City, north to Pyramid Lake, and east to Fallon. This species being an annual is subject to extreme population fluctuations from year to year. Camissonia nevadensis did not develop very well in 1979 due to a period of cold weather in May followed by a period of very hot dry weather. Most plants observed were less than 3 inches tall and 4 inches across. Due to poor development this species was only located in the Hungry Valley north of Reno and was not relocated at any known sites. This species has been recorded as occurring in sandy areas even though it was originally recorded as growing only in clay flats. Most of the known locations are in sandy areas and the new populations from the Hungry Valley are found in silty clay soils. It appears that this plant is able to move into the sandier areas when conditions are optimum and is limited to the clay flats in bad years.

This plant was searched for throughout the study area wherever clay flats occurred. The only sites where it was successfully located were those in the Hungry Valley.

Urban development north of Reno and Sparks poses the greatest threat to this plant but it is found frequently along roadsides and even appears to do well with moderate to heavy disturbance. The critical habitat of Camissonia nevadensis should include portions of sections 28, 32, and 33 of T22N, R20E, because

this land is administered by the Bureau of Land Management and most of the other known locations are on private property.

This plant is virtually unaffected by grazing, chemical spraying, brush plowing and chaining, burning, and seeding due to the fact that it is an annual and viable seed will remain in the area even if part of the population is destroyed.

It appears at this time that Camissonia nevadensis should not be listed as endangered on any proposed state or federal lists. In fact, this plant should most probably be deleted from all proposed lists. This species is very common throughout the study area; there are many scattered known populations; all populations contain large numbers of individuals in good years; this plant does well with some disturbance; there are no threats to a major portion of its range, only to isolated populations; seed production is good even in relatively poor years; and there are vast areas of suitable habitat in the Reno ES Area. For these reasons this plant does not adequately qualify under federal criteria for designation as threatened or endangered.

Draba douglasii Gray Proc. Amer. Acad. 7:328. 1867.

Common name: Douglas draba

Description: A tufted perennial from long heavy tap root; leaves basal, thick and leathery, oblanceolate, the midrib very prominent, 5-12 mm. long, 1-2 mm. broad, ciliate with straight stiff simple or forked hairs and often sparsely pubescent with unbranched or forked hairs; scapes 1-3 cm. tall, soft-pubescent with simple or forked hairs, as are the pedicels; racemes 2-10 flowered; pedicels ca. equal to fruits; sepals 2-25 mm. long, glabrous (sparsely pubescent); petals 4-5 mm. long, white; silicles ovoid, walls short unbranched hairs; styles 0.5-1.5 mm. long, slender; ovules 4, seeds 1 or 2, ca. 2 mm. long.

*Flowering time: March-June

Location: Washoe Co., Pyramid Planning Unit, T20N, R18E, Sec. 24, near Poeville site; T20N, R19E, Sec. 17, south of Black Springs.

Habitat: Rocky ridges in foothills of lower mountains at 5800 feet

Vegetation type: Artemisia nova, Bromus tectorum

Geology: Tertiary igneous gravel

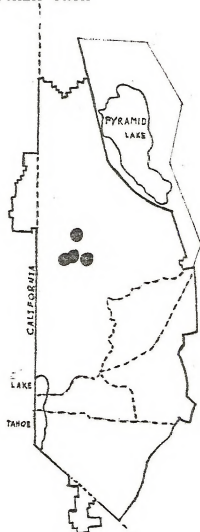
Condition: Stable

Population observations: Several hundred individuals in each population

Land ownership: Private and BLM

General distribution: Washoe, Humbolt and Elko counties in Nevada, California, Oregon, Idaho and Washington

Status: Reviewed as threatened (Federal Register 1975); proposed as threatened (Federal Register 1976); Recommended for delisting (Henderson et al 1977); recommended for delisting. The total range of the plant is large and the plant appears to be quite numerous within each population.



Draba douglasii has the largest total range of any plant species designated as proposed threatened or endangered found in the Reno ES Area. This species is found commonly in Nevada, California, Oregon, Idaho and Washington. The habitat of this species is rocky ridges in the foothills of low mountains. It is found in dry rocky and often disturbed sites such as talus slopes. Draba douglasii was located at several locations during the 1979 field season and appears to be quite common. Seed production was very good and all populations appear to be quite healthy and large.

This species was searched for intensively in the Peavine Peak area, in the hills north of Sun Valley, and in the Hungry Mountain, Warm Springs Mountain, Freds Mountain, and Petersen Mountain areas. The plant was not located at any of these sites.

Designated critical habitat is not necessary for this plant but if one were to be established it should include all or part of section 24, T20N, R18E, near the Poeville site near Peavine Peak. This species would most probably not be affected by land management treatments because its habitat is very rocky and steep and would be subjected to severe erosion and would therefore not be plowed or chained or sprayed or reseeded at all. Fire and grazing are not detrimental to this plant because of its low stature.

This species was first reviewed as threatened but was then proposed for delisting (Henderson et al 1977). Draba douglasii should be deleted from all proposed threatened and endangered

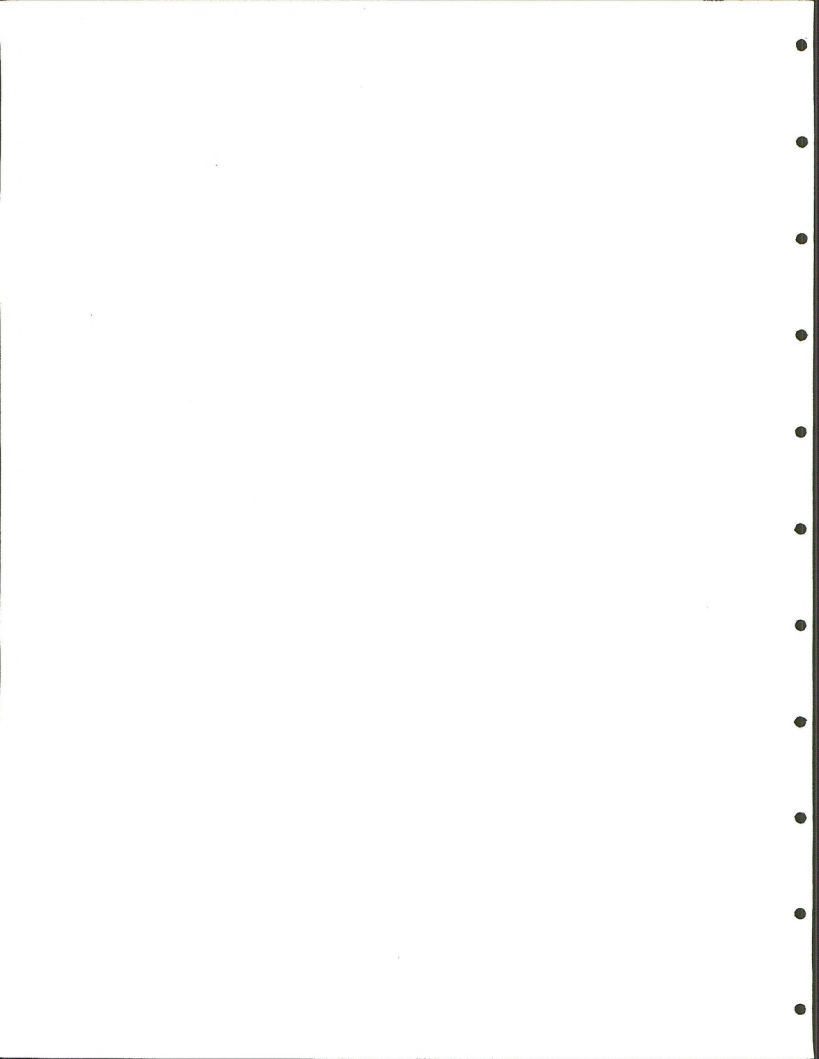
plant lists. The total range of this plant is quite large and there is no threat to its existence at this time. All populations of this plant located were very large and healthy.

Eriogonum lemmoni Wats. Proc. Amer. Acad. 12:266. 1876.

Common name: Lemmon Wildbuckwheat

Description: Rather stout, a span high, more or less hirsute with very short spreading hairs, not at all tomentose; leaves orbicular-reniform, 6 to 9 lines broad, on slender petioles; peduncle fistulous or inflated, bearing a naked 3-rayed narrow umbel, twice or thrice divided; involucre glandular-pubescent, rather broadly turbinate, $1\frac{1}{2}$ lines long; flowers pale rose-color, half a line long, with narrow sepals.

*Flowering time: May-June



Location: Churchill Co., out of study area, T18N, R26E, Sec. 16, and Sec. 15 & 22; Lyon Co., out of study area, T18N, R25E, Sec. 12; Lyon Co., out of study area, T18N, R24E, Sec. 1 & 12; Storey Co., Pyramid Planning Unit, T20N, R23E, Sec. 24, hills south side of Truckee canal.

Habitat: Heavy silt and clay mixed with some coarse sand and covered by volcanic cobble or gravel at 4000-4500 feet.

Vegetation type: Sarcobatus baileyi, Artemisia spinescens, Atriplex confertifolia, Artemisia spinescens, and Bromus tectorum.

Geology: Quaternary alluvium, terraces and lake deposits.

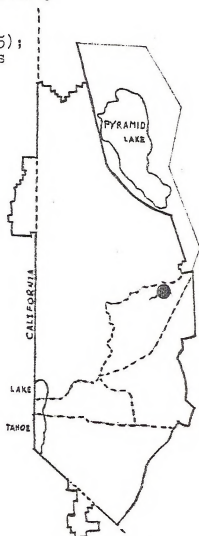
Condition: Moderately stable

Population observations: All specimens spotted were last years dead stalks except at the Lake Lahontan population. There were several dozen plants all in flower. Rodent damage was bad.

Land ownership: Private and State Park

General distribution: Washoe, Churchill, Lyon and Storey Counties in Nevada.

Status: Reviewed as extinct (Federal Register 1975); recommended as endangered 1978; retain as endangered due to lack of development and rodent damage in 1979.



Eriogonum lemmonii was reviewed as extinct in the federal threatened and endangered species register in 1975. This plant has since been rediscovered and several populations were located in 1978 and in 1979. Eriogonum lemmonii is an annual and is therefore subjected to dramatic population fluctuations from year to year. Because of the harsh habitat inhabited by this plant it can be abundant one year and non-existent the next. Such is the case when comparing 1978 and 1979. The species was reported as very abundant in populations at Lake Lahontan and near the Painted Rock exit on Interstate 80, in 1978. During the 1979 field season no living specimens were seen at the Painted Rock location and less than 50 individuals were counted at Lake Lahontan. At both locations and at 3 new locations many of the stems of dead plants from the previous year were noted. All populations appeared to be quite large in 1978. The live individuals at Lake Lahontan appeared to be under heavy stress due to rodent damage. Many of the plants had lost most of or all of the flowering branches. Freshly clipped branches were noted in the area, some with flowers still fairly fresh. Reproduction could be drastically reduced due to the damage inflicted, however, considering the number of dead plants in the area, there is probably an ample amount of viable seed in the area waiting for more favorable conditions.

Eriogonum lemmonii is found growing in a heavy silt or clay soil mixed with some coarse sand and containing large concentrations of gypsum. This habitat is terraces and old lake deposits.

These areas tend to be very dry and water infiltration is minimal. As a result in poor years plants tend to be concentrated in the washes. This is the case at the Lake Lahontan population. It was the only population observed that had live plants and all of them were concentrated in a wash bed very close to the lake itself.

The species was searched for along Interstate 80 from Lockwood to Fernley, along HWY 34 from Fernley to Pyramid Lake, in the Churchill Canyon area, and in the area around Churchill Butte and Table Mountain. The plant was also looked for between Fernley and Silver Springs but was not located in these areas.

The most appropriate critical habitat area would be portions of section 16, T18N, R26E, within the boundaries of Lake Lahontan State Park. This species has been found at only one location within the study area and it is on private land. There is no evidence of damage to this plant as a result of grazing, chemical spraying, brush plowing, brush chaining, controlled burning or reseeding. This species is found in a habitat that is very rough physiographically and otherwise not suitable for any of the above mentioned management practices. There does not appear to be any definite threat to this species at this time. Rodent damage was very heavy in 1979, but this was not thought to be critical. Because it is an annual, status judgements are difficult to make on a year to year basis. However, most of the evidence seems to indicate that this plant probably does not require federal listing and could deserve no more than a threatened listing otherwise. This plant's known

range is large within this region going from Interstate 80 in the north down to the Walker River south of Yerington. There are several known locations for this plant and three new ones were located by Rangeland Resources. All populations show evidence of large concentrations of plants within the suitable habitat area and this portion of Nevada contains a very large number of suitable habitat areas. This plant will most probably be found at many more locations in the near future. There appears to be no serious threat to a major portion of this plant's habitat. In fact none of the populations observed is threatened at this time. Population numbers have been reduced as were populations of other annuals in the area during the 1979 field season. This is not a threat to the plant's existence, however, and individual plants should be plentiful in more optimum years. The rodent damage observed would not be deemed a serious threat although it could reduce the seed production during one growing season.

Eriogonum lobbii T & G. var robustius (Greene) Jones

Common name: none

Description: Few-branched from stout woody caudices, covered with hairy bases of dead lvs., lvs. in tufted rosettes, mostly round-oval, plane, densely tomentose especially below, the lf.-blades 1-4 cm. long, abruptly narrowed into petioles as long or longer; scapes flat on the ground or decumbent, tomentose, 0.5-2 dm. long, with foliaceous bracts subtending the 2 to several-rayed umbels; rays 1-3 cm. long, woolly-hirsute; invols. campanulate, 8-12 mm. long, the lobes reflexed; calyx white to rose (especially in age), 5-7 mm. long, the base scarcely stipitate, the stipe mostly less than 1 mm. long, the calyx-segms. oblong-obovate; fls. hairy basally; aks. lance-ovoid, glabrous, shining, olive-green, 4.5-6 mm. long, 3 angled at the apex. In western Nevada var. robustius (Greene) Jones (E. R. Greene) occurs and may be distinguished by its larger flowers, leaves, and higher and more robust stature when seen in the field.

*Flowering time: June-August

Location: Washoe Co., Pyramid Planning Unit, T20N, R19E, Sec. 31 & 32, Nevada Central Mine; T20N, R18E, Sec. 35 & 36; T19N, R18E, Sec. 1 & 2; T20N, R19E, Sec. 24 & 25, radio tower near Panther Valley; Storey Co., Pyramid Planning Unit, T19N, R21E, Sec. 16, 20, 21, 22, Lockwood; Storey Co., Pine nut Planning Unit, T16N, R21E, Sec. 4 & 5, T17N, R21E, Sec. 32 & 33; Gold Hill and Mt. Grosh area; T17N, R21E, Sec. 23, 24, 25 & 26, T17N, R22E, Sec. 19 & 20, Flowery Mining District; Washoe Co., Pine nut Planning Unit, T18N, R20E, Sec. 25, 26, 34, 35, & 36, T17N, R21E, Sec. 6, 7 & 8, Geiger Grade area; Lyon Co., Pine nut Planning Unit, T18N, R23E, Sec. 1, 2, 3, 11, 12, T19N, R23E, Sec. 34 & 35.

Habitat: Rocky talus slopes in mining areas at 5000 - 7000 feet.

Vegetation type: Very little else growing on these slopes

Geology: Strongly altered (by acid-rich solutions related to the original ore mineral process) Tertiary tuffaceous rhyolite and some andesite.

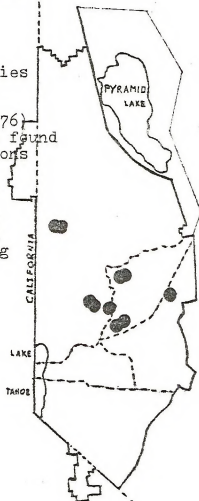
Condition: Stable

Population observations: All above mentioned populations contained at least several hundred individuals. Some had several thousand.

Land ownership: Private and BLM

General distribution: Washoe, Storey and Lyon counties in Nevada

Status: Reviewed as threatened (Federal Register 1976) recommended for delisting. This plant is found in very large numbers in scattered locations throughout the study area. There are sufficient individuals and populations to insure its existence. This plant seems to do well with some disturbance. Almost all seedlings and young plants were found in highly disturbed areas. Renewed mining activity and road building pose the only threats to this plant.



Eriogonum lobbii var. robustis is a narrow endemic restricted to the mountains of western Nevada specifically in the Reno and Virginia City area. This plant is found growing only on deposits of andesite and highly modified tertiary tuffaceous rhyolite. These rocks occur in talus slopes long associated with the mining sites in this area. The rock has been modified by acid-rich solutions related to the original ore mineral process. Outcrops of this type are limited in number but sometimes cover fairly large areas. Eriogonum lobbii var. robustius was noted growing at all locations of this type except at a site near Como Mining District in the Pine nut Mountains. The absence of this plant was not understood but seed dispersal could be one of the major problems. Several likely looking sites in the Virginia Mountains were searched thoroughly but these did not match the sites in the Virginia City area and no plants were found.

Critical habitat for this species should include parts of sections 31 & 32, T20N, R19E and any part of Geiger Grade. This species is of abundant that critical habitat designation is hardly necessary. Because it grows on steep talus slopes this plant will not be adversely affected by land use treatments such as grazing, brush plowing, brush chaining, reseeding and chemical spraying. Fire should not be a threat to the existence of this plant either.

Eriogonum lobbii var robustius has been reviewed for threatened status and from the data generated by this study it

can clearly be seen that this designation is not necessary at this time. The total range of this taxon is very small and suitable habitat is very restricted. The suitable habitat areas are usually fairly large, however, and the plant is very common in all locations. All of the populations of this plant tend to be quite large and the species does well with some disturbance. There is no threat to this species at this time but increased mining activity or road building near Virginia City could threaten some plants. This plant has survived alongside mining activities for the past 100 years and has thrived. In fact no suitable areas or populations have been destroyed by past mining practices and therefore these are not definite threats to the existence of the plant.

Lupinus malacophyllus Greene, Pittonia 1:215. 1888.

Common name: none

Description: Plants erect, 10-15 cm. tall, commonly with several basal branches flowering as the central raceme is in fruit and commonly equalling the central raceme, hirsute throughout; petioles 2-4 cm. long; leaflets 5-7, oblan-ceolate, distinctly pubescent above; peduncles 5 cm. long; racemed compact, 4-8 cm. long, 3-9 verticils, distinct, at least below; flowers 11-14 mm. long, white to yellowish with a pale bluish tint; the banner yellow, tinted in age; upper lip of calyx slightly gibbous at the base; pods 6 mm. wide, slightly constricted between the seeds; ovules generally 2.

*Flowering time: March-July

Location: Washoe Co., Pyramid Planning Unit, T20N, R20E, Sec. 21, 16, 10, Spanish Springs Valley; Douglas Co., Pine nut Planning Unit, T11N, R21E, Sec. 26, 22, Double Spring; T11N, R21E, Sec. 15, 9, near Carters Station site; T12N, R21E, Sec. 31, Bodie Flat.

Habit: Coarse sandy soil especially alongside roads at 5000-6000 ft.

Vegetation type: Artemisia tridentata, Chrysothamnus viscidiflorus, Bromus tectorum

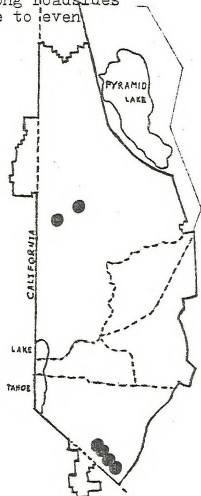
Geology: Tertiary volcanics with Tertiary igneous gravel

Condition: Stable but highly variable from year to year

Population observations: About a dozen individuals in all of the northern populations. About 75 individuals in the Double Spring area, about 40 in Bodie Flat, and about 24 individuals at the other site.

Land ownership: Private and BLM

Status: Reviewed as threatened (Federal Register 1976); recommended for delisting. The range covers a large area and although population numbers are highly variable from one year to the next, the populations are large and reproducing well. The plant is found along roadsides and appears to do very well with moderate to even heavy disturbance.



Lupinus malacophyllus was one annual species that did very well in 1979. This species was located several times in large numbers throughout the growing season. Plant development and seed production was very good. This species because it is an annual, is subjected to extreme population fluctuations from year to year. The true status of the plant is therefore difficult to determine because one year it will be very abundant and nonexistent the next.

Critical habitat for this plant would include parts of section 26 and 22, T11N, R21E but is not necessary at this time. Brush plowing, brush chaining, spraying, controlled burns, reseeding and grazing would not affect this plant because it is an annual and viable seed will persist in the suitable habitat even if some or all of the living individuals are destroyed.

This species was reviewed as threatened but should be delisted. The range of this plant is very large and the plant is very common within the study area. Plant vigor was good in 1979 and there was good seed production. This plant grows very well in disturbed sites such as along road sides and there is no definite threat to its existence.

Mimulus washoensis Edwin Leaflets of Western Botany 7:221. 1955.

Common name: none

Description: Annual; stem upright, unbranched, up to 10 cm. high, glandular-pubescent; leaves lanceolate, lance-linear, or elliptic, occasionally obovate, sessile, entire or nearly so, up to 1.8 cm. long, 3-6 (8) mm. wide, ciliate; pedicels shorter than the subtending leaves, 2-4 mm. long, pubescent or glandular-pubescent; calyx 0.8-1.1 cm. long, filled by the capsule (but not expanded). Ovate to somewhat campanulate, pubescent, veins red at maturity, the teeth 2-3 mm. long, acute, ciliate, subequal or rarely equal; corolla up to 2.5 cm. long, withering in place, tube well exerted, yellow, drying brown, with 2 densely hairy ridges inside, lobes broadly expanding, equal or almost so, yellow, dotted and striped with purple; upper pair of stamens exerted, only a little shorter than the style, filaments crossing at apex, anthers with a row of cilia along the upper margins, filaments glabrous; style pubescent with white hairs over most of its length, stigma-lips ovate, fimbriate, equal; capsule little exceeding the calyx at maturity, lance-ovate, dehiscent along the inner suture, placentae splitting their entire length, adhering to the valves; seeds numerous, smooth, shiny ellipsoid, apiculate at one or both ends.

*Flowering time: May

Location: Washoe Co., Pyramid Planning Unit, T22N, R20E, Sec. 25, 26, Bacon Rind Flat; T21N, R20E, Sec. 2, Spanish Springs Valley; T22N, R19E, Sec. 25, 25, Hungry Mountain; T22N, R19E, Sec. 33, 34; T21N, R19E, Sec. 3, 4, Hills north of Lemmon Valley; T21N, R20E, Sec. 30; T21N, R19E, Sec. 36, hills southeast of Lemmon Valley.

Habitat: Coarse granitic sand at 4500 - 5500 feet.

Vegetation type: Juniperus osteosperma, Artemisia tridentata, Stipa speciosa, Sitanion hystrix, and Oryzopsis hymenoides.

Geology: Quaternary alluvium including Tertiary igneous sand

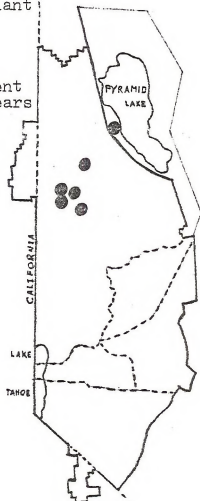
Condition: Stable yet highly variable from year to year

Population observations: Several dozen individuals counted in all of the populations located. Individuals were very small.

Land ownership: BLM and private land.

General distribution: Washoe Co., Nevada

Status: Reviewed as threatened (Federal Register 1976) Recommended for delisting. The plant is an annual and is therefore subject to extreme population fluctuations from year to year but the plant is fairly widespread and populations are large. Suitable habitat for this plant covers most of Washoe County and there appears to be no serious threat to its existence other than some urban development north of Reno and Sparks. The plant appears to do well in disturbed sites, though.



Mimulus washoensis is another annual found in the Reno ES Area. This plant is found on coarse granite sand in Washoe county Nevada. Because of the poor growing conditions in 1979 this species did not do too well. It was discovered at several new locations but all individuals located were very small and poorly developed. Seed production was adequate, however. The range of this plant is fairly large and most of the area north of the Truckee River is suitable habitat. During a good year this plant will be found in many new locations. Mimulus washoensis is probably much more common than was previously thought, but because of population fluctuations from one year to the next its real status is hard to establish.

Critical habitat would include section 36, T21N, R19E, if it were deemed necessary. This plant would not be affected by land management treatments because it is an annual and grows in loose sand.

Mimulus washoensis was reviewed as threatened but should probably be delisted. The range of this plant is relatively large and almost all of it is suitable habitat. The plant seems to be very common and abundant in known locations but is subject to fluctuations from one year to the next. There is no definite threat to the existence of this plant at this time.

Opuntia pulchella Engelm., Trans. St. Louis Acad. 2:201, 1863.

Common name: none

Description: Low 10 to 20 cm. high, densely branched, sometimes forming compact heads 6 dm. in diameter, main stem more or less definite, covered with areoles bearing yellow glochids 10 to 12 mm. long; lateral joints 5 to 6 cm. long, narrowly clavate, strongly tuberculate, purplish; areoles 6 to 8 mm. apart, 2 to 3 mm. broad; spines 10 to 16, slender, reddish, the longer ones 5 to 6 cm. long, somewhat flattened; flower 5 cm. long, when open, fully as broad; petals purple, 3 cm. long; ovary 2 cm. long, bearing numerous areoles filled with white wool and purple glochids 10 to 12 mm. long; fruit about 2.5 cm. long; seeds (according to Coulter) thick and round, 4 mm. in diameter, with broad flat commissure.

*Flowering time: May-June

Location: Lyon Co., Pine Nut Planning Unit, T14N, R24E, Sec. 6, Churchill canyon near Sarido Well; Storey Co., Pyramid Planning Unit, T20N, R23E, Sec. 24, hills on south side of Truckee canal; Lyon Co., Outside area, T19N, R24E, Sec. 1, South of Fernley.

Habitat: Loamy, rocky, desert flats and rolling foothills at 4600 feet.

Vegetation type: Sarcobatus baileyi, Artemisia spinescens and Atriplex confertifolia

Geology: Quaternary alluvium

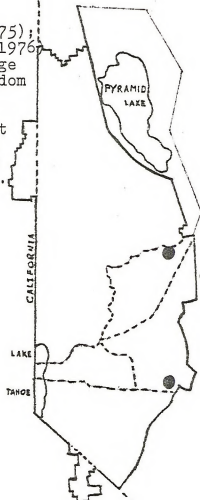
Condition: Moderately stable

Population observations: less than 5 individuals spotted at each site, plants are very scattered and difficult to locate, there appears to be much damage to individuals from rodents.

Land ownership: Private and BLM

General distribution: Churchill, Nye, Pershing, Washoe, Lyon, Storey, Esmeralda, White Pine, and Lander Counties in Nevada, Toole and Millard counties in Utah and in Arizona.

Status: Reviewed as threatened (Federal Register 1975); proposed as threatened (Federal Register 1976). Recommended for delisting. The total range of the species is large, and although seldom if ever abundant, there seems to be no contemporary threat to its perpetuity. Cactus collecting poses the biggest threat but the plants are very inconspicuous and scattered and there is an enormous amount of suitable habitat within the study area. The plants are much more common than indicated by population numbers counted.



Opuntia pulchella is normally found in loamy rocky flats and hot dry foothills of desert mountains in Nevada, Utah, and Arizona. It is very low growing, usually very scattered and tends to be quite inconspicuous. This particular plant is probably very common throughout the west but is seldom collected because it is so difficult to locate and is not very striking except when in flower. Three new locations of this plant were discovered in 1979 by Rangeland Resources with only one of them not occurring in the study area.

This plant was searched for all over the study area because its habitat covers most of the study area. The plant was not located very often but this may be attributed to its small stature and spotty distribution rather than scarcity.

Due to the very scattered and spotty distribution of this plant it is very difficult to designate an area as critical habitat but if one was to be established in the study area it should probably include section 6, T14N, R24E.

The habitat that this small cactus is found in is very rocky and rough land and would not normally be designated for land management treatments such as chaining, plowing, spraying and reseeding and these practices should therefore not be a definite threat to this plant. Grazing and controlled fires pose no threat to the species because of its regenerative capabilities. The only threats to the existence of this plant appear to be cactus collecting and rodents. During the field survey damage to several individual plants was noted along with

many dead plants. These plants died as a result of rodent and insect damage to the root system and crown of the plant.

Opuntia pulchella was reviewed as threatened but this designation does not appear to be necessary at this time. The range of this species is very large and suitable habitat is very common and makes up a large portion of the Reno ES Area. New locations are continually being discovered and there will be more found in the future. The problem with this plant has been in finding individuals. It is probably very common and suitable habitat is abundant, but the plants are very inconspicuous and scattered. There is no threat to a major portion of the range of this plant and damage caused by insects and rodents is probably very insignificant. Opuntia pulchella is much more common than indicated by populations located and numbers counted and should be deleted from all proposed threatened and endangered species lists.

Penstemon rubicundus Keck American Midland Naturalist 18:
802. 1940.

Common name: None

Description: Herba perennis 5-12 dm alta; caulibus multis erectis e basi suffrutescente glabris glaucis; foliis glaucis crassiusculis, inferioribus oblongo-ovatis argute denticulatis in petiolum marginatum angustatis, superioribus ovato-lanceolatis cordato-amplexicaulibus distinctis saepe subintegris 5-10 cm longis 2-5 cm latis; thyrsos virgato usque ad 9 dm longo parce glanduloso-pubentibus; pedunculis erectis brevibus 2-4-floris; sepalis 4-5 mm longis paulo accrescentibus ovatis acutis; corolla rubicunda (rosea) 27-35 mm longa 10-15 mm lata extus glanduloso-pubescente intus supra dense viscido, fauce e tubo calyce duplo longiore paulatim latissime campanulato-ampliata, ore hiantes, labio inferiore basi intus moderate villosa, lobis recurvis; staminibus fertilibus glabris vel basi minute viscido-puberulente, loculis antherarum suboppositis pelate explanatis 1.5 mm longis 1 mm latis, staminodio exserto apice incurvo insigniter flavo-barbato, barba 1.5-2 mm long.

*Flowering time: May-June

Location: Douglas Co., HWY 395, T10N, R22E, Sec.7, Hotbrook
Junction out of study area.

Habitat: Along roadside in sandy, gravelly soil at 5800 feet.

Vegetation type: Artemisia tridentata, Chrysothamnus viscidiflorus

Geology: Cretaceous nonmarine sedimentary rocks

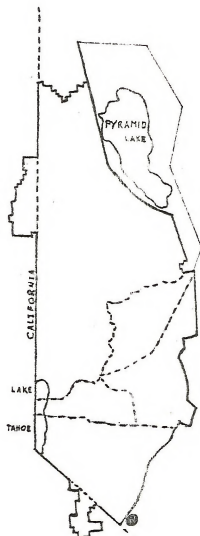
Condition: Moderately stable

Population observations: 9 individuals, 2 dead and 7 live.
Three have viable seed in 1979. Population is 10 to
20 feet from the road surface.

Land ownership: Private land

General distribution: Douglas and Mineral Counties in Nevada

Status: Reviewed as endangered (Federal List, 1975); recom-
mended as endangered.



Penstemon rubicundus was located about 2 miles from the study area boundary and although it does not occur in the Reno ES Area, this plant needs some protection. The species is found more commonly to the south and east of the study area in rocky, sandy soil mountain foothills.

Penstemon rubicundus was searched for most intensively along HWY 395 between Gardnerville and Holbrook Junction, all over the Pine Nut Mountains, and in the foothills of the Pine Nut Mountains. The plant was located only at the site near Holbrook Junction.

The population located was very small and is in danger of being destroyed by road improvement and vehicular traffic. Only nine plants were counted in 1979 and two of those were dead. Critical habitat would include Sec. 7, T10N, R22E. This plant was reviewed as endangered and should retain that designation. The plant is not palatable to livestock and probably would not be subjected to land management treatments but still requires special consideration.

Trifolium andersonii Gray ssp. beatleyae Gillett Canadian
Journal of Bot. 50:1996-1997. 1972.

Common name: Five-leaf clover

Description: Not available

*Flowering time: April-July

Location: Storey Co., Pyramid Planning Unit, T19N, R21E,
Sec. 20 & 21, near Lockwood; Douglas Co., Pine Nut
Planning Unit, T14N, R22E, Sec. 23, north of Mt. Como.

Habitat: Dry silt or clay soils on ridges or on the edge of
meadows at 7500 to 8000 feet.

Vegetation type: Dry meadow

Geology: Quaternary alluvium

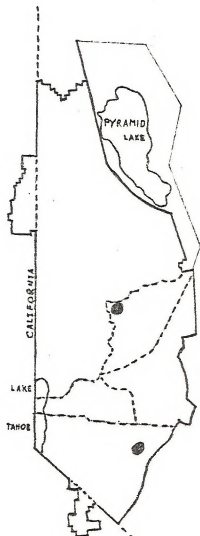
Condition: Unknown

Population observations: Not available

Land ownership: Private and BLM

General distribution: Washoe and Storey Counties in Nevada and
in California

Status: Reviewed as endangered (Federal Register 1975); Recommended
for endangered status.



Trifolium andersonii ssp. beatleyae was not located by Rangeland Resources during the 1979 field season. This species is not common in the study area and is known from only two sites within the Reno ES Area. No new populations were located for this taxon but the typical subspecies was located several times. This is very low growing clover forming large mats from a heavy woody caudex. The species is found most commonly in the dry portion of a wet meadow area in silty or clay soil that is slightly alkaline.

At the site near Mt. Coma Trifolium andersonii was collected in the exact area where Trifolium andersonii ssp. beatleyae is known to occur. The plant was quite common at the site but only one population was observed even though the area was thoroughly searched. The plants collected by Rangeland Resources at that site were identified by Dr. Stanley Welsh, curator of the Herbarium at Brigham Young University, as ssp. monoense and not ssp. beatleyae. It appears that the original collection of ssp. beatleyae at that site may have been a misidentification.

Trifolium andersonii ssp. beatleyae was searched for intensively near Lockwood, near Mt. Como, along HWY 395 between Gardnerville and Holbrook Junction, and all through the Pine Nut Mountains and the Virginia Range. The plant was not located at all in the Reno ES Area.

Critical habitat for this plant should include portions of section 20, T19N, R21E, near Lockwood, however, this is all private land. This plant is not adversely affected by grazing

Trifolium lemmonii Wats. Proc. Am. Acad. 11:127. 1876.

Common name: Lemmon clover

Description: Dwarf and caespitose, alpine, sparingly appressed-pubescent, the short rather slender stems from a stout thick perennial root; stipules ovate, acuminate, toothed; leaflets three to five, thick, obovate, obtuse coarsely toothed, half an inch long or less; peduncles mostly terminal, equalling the leaves; flowers numerous, spicate upon a short rhachis (only two lines long), very small (so far as known); calyx villous, two lines long, the filiform plumose teeth exceeding the purplish petals; banner deeply hooded; ovary smooth, 2 ovuled.

*Flowering time: June-July

Location: Washoe Co., Pyramid Planning Unit, T20N, R19E, Sec. 17,
south of Black Springs.

Habitat: Dry rocky slopes of low foothills at 6000 feet

Vegetation type: Artemisia tridentata, Poa sandbergii, Bromus
tectorum, Purshia tridentata

Geology: Quaternary alluvium

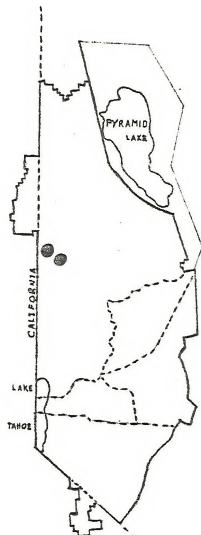
Condition: Stable

Population observations: Several dozen individuals but none bloom-
ed in 1979 by the last of June all members of the popu-
lation were dry.

Land ownership: BLM

General distribution: Washoe Co. in Nevada and California

Status: Reviewed as endangered (Federal Register 1975);
Recommended as endangered. Urban expansion threatens
the population south of Black Springs.



Trifolium lemmonii is one of the least common of the proposed threatened and endangered plants found in the Reno ES Area. It was only known from Toiyabe National Forest on the west side of Peavine Peak prior to the 1979 field season. The plant was located by Rangeland Resources on the east side of Peavine Peak on BLM land growing alongside Draba douglasii. Trifolium lemmonii is found on dry rocky slopes of foothills of lower mountain ranges. The population located in 1979 did not flower. The plants were first located in late May and by late June all individuals were completely dry and there was no flower or fruit production. The plants were, however, very abundant in the site.

This species was searched for all through the Peavine Peak Area, at Petersen Mountain, at Dogskin Mountain, at Freds Mountain, and in the Virginia Range and Virginia Mountains. The plant was not found in any of these areas.

The critical habitat of Trifolium lemmonii should include Section 17, T20N, R19E, south of Black Springs.

This species would be susceptible to grazing because it is a clover and grows in a site where there is very little forage available other than sagebrush and some sandberg's Bluegrass. It does not grow on a site that is suitable for brush plowing, chaining, reseeding, or spraying. Fire would not be detrimental to this plant.

The species was reviewed as endangered and from the data gathered it would appear that it should remain so. If more

populations are located it could be dropped to threatened, but at this point that change is not necessary. The range of this species is very small and there are very few known locations. Population numbers are good but grazing and increased urban development pose threats with the latter being the most serious.

For the following group of plants, personal status recommendations can not be given properly because these species have not been located within the Reno ES Area and because they were not located during the 1979 field season.

Abronia orbiculata Standley Contr. U.S. Natl. Herb. 12:323. 1909.

Common name: none

Description: Perennial, much branched from the base; stems ascending 25 cm. high, glandular-puberulent throughout; leaf blades orbicular or very broadly elliptical, rounded at both ends, thick, glandular-puberulent throughout; petioles mostly much longer than the blades; peduncles 35 to 50 mm. long, sparingly puberulent; bracts 5, elliptical, scarious, obtuse; flowers scarcely more than 10 mm. long, their tubes sparingly puberulent or glabrous; turbinate, 5 mm. long and 3 mm. wide, with narrow thin wings, these truncate above or slightly rounded, the fruit thus either obpyramidal or obcordate in outline.

*Flowering time: April-August

Location: Washoe Co., T21N, R25E, Sec. 18, northeast of Fernley
at 5000 feet.

Habitat: Deep sandy soils with some alkalinity.

Vegetation type: Unknown

Geology: Quaternary alluvium

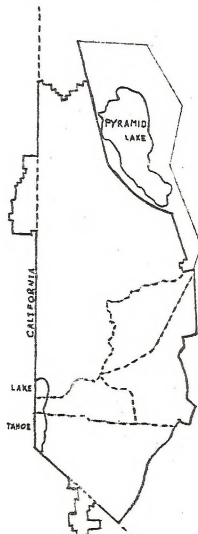
Condition: Unknown

Population observations : Not available

Land ownership: Private and BLM

General distribution: Clark, Nye, Lincoln and Washoe counties
in Nevada

Status: Reviewed as threatened (Federal Register 1975);
recommended for delisting by Holmgren. This plant
should be included in Abronia turbinata and not
considered as a distinct species.



Elodea nevadensis St. John Res. Stud. State Coll. Wash. 30(2):
41. 1962.

Common name: None

Description: Submerged aquatic, dichotomously branched; lower leaves 4 mm. or more in length, opposite, ovate-acute; median and upper leaves 7-15 mm. long, 1-2 mm. wide, in whorls of three, linear-lanceolate, minutely serrulate, dull green, thin but not flaccid, those of the upper nodes rather crowded but usually divaricate; pistillate spathe 9-11 mm. long, cylindric with a narrowly ovoid base, the tips of the bidentate apex ascending; pistillate flowers exerted from the spathe by the thread-like, elongating base of the hypanthium which is 15-40 mm. long; sepals 3.3 mm. long, 1 mm. broad, oblong elliptic, cucullate at tip, faintly dark lined near the apex; petals 3 mm. long, 1.1 mm. wide, white, delicate, spatulate; staminodia three, the basal portion subulate, thickened and at times partially divided as if into two anther sacs, the apex expanded and petaloid; stigmas three, 3.3 mm. long; slender, two-cleft at apex; capsule slender conic ellipsois; staminate flowers unknown.

Location: Washoe Co., Pyramid Indian Reservation near Wads-
worth

Habitat: Aquatic

Vegetation type: Aquatic

Geology: Unknown

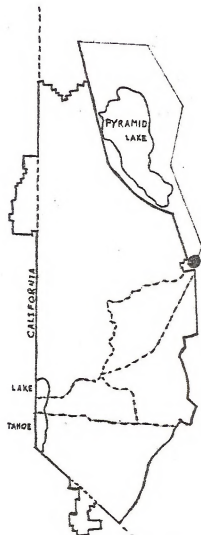
Conditon: Extinct

Population observations: Not available

Land Status: Indian Reservation

General distribution: Washoe County, Nevada; ponds at Wads-
worth

Status: Reviewed as extinct (Federal Register 1975).



Machaeranthera leucanthemifolia

Common name: none

Description: Biennial or short-lived perennial from a taproot, usually branched and several-stemmed, 1-5 dm. tall, or in robust forms up to 1 m. herbage finely canescent-puberulent, and often glandular in the inflorescence; leaves usually toothed, the teeth and apex spinulose tipped; basal leaves linear-oblongate to spatulate, up to 10 cm. long (including the petiole) and 15 mm. wide, often deciduous, the cauline ones smaller, often linear; heads more or less numerous, the involucre 6-10 mm. high, canescent or glandular or both, its bracts conspicuously imbricate and multiseriate, relatively narrow, seldom over 1 mm. wide, with short green, more or less squarrose tips, occasionally more or less suffused with anthocyanin; rays few, mostly 8-25, bright bluish purple, 5-12 mm. long, or the pistillate flowers very rarely wanting; style appendages equaling or longer than the stigmatic portion; achenes 3-4 mm. long.

*Flowering time: April-October

Location: Genoa (not located in study area during 1979)

Habitat: Variable

Vegetation type: Variable

Geology: Variable

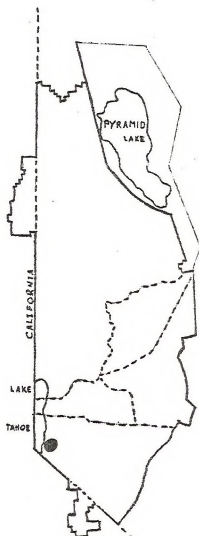
Condition: Unknown

Population observations: Not available

Land ownership: Private, BLM, USFS

General distribution: Washington, Montana, Idaho, Oregon,
Colorado, and Nevada

Status: Reviewed as endangered (Federal Register 1975);
recommended for delisting 1977. This plant is a minor
variant of Machaeranthera canescens, a very common
species.



Oryctes nevadensis Wats. King Exp. 274. 1871.

Common name: none

Description: Small, 2-4' high, scurfy and viscid-pubescent; leaves 1-2' long, ovate, oblong or lanceolate, attenuate into the petiole, entire, undulate-margined; flowers small, in axillary umbels of 3-4, on short pedicels; calyx $1\frac{1}{2}$ -2" long, campanulate, the ovate acutish lobes twice longer than the tube, enlarging in fruit and equaling the capsule; corolla 3" long, blue or purplish, plicate in aestivation, scarcely at all dilated above, the lobes short, triangular, erect; stamens and style nearly equaling the corolla, or some of the stamens shorter; capsule $2\frac{1}{2}$ " in diameter; seeds 10-20, $1\frac{1}{2}$ " broad, narrowly margined, the cavity of the flattened testa much exceeding the small albumen.

*Flowering time: May

Location: Washoe Co., Pyramid Lake Indian Reservation, T20N,
R24E, Sec. 4, 9; T21N, R24E. Sec. 33.

Habitat: Rocky barren foot-hills, desert pavement at 4200 feet

Vegetation type: unknown

Geology: Tertiary volcanics

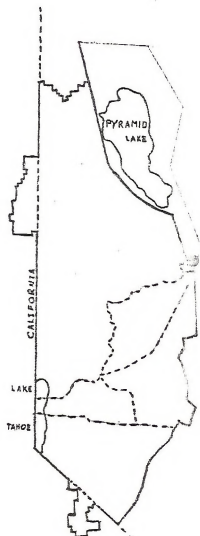
Condition: Unknown

Population observations: Not available

Land ownership: Indian Reservation

General distribution: California, Idaho, Nevada

Status: Reviewed as threatened (Federal Register 1976); recommended as threatened. This plant has been collected adjacent to the study area but was not located on BLM land. There appears no definite threat to this plant within the Indian Reservation at this time but urban expansion is possible.



The following section includes those high altitude endemics found within the Reno ES Area but restricted to private and national forest land. The habitat types required by these plants are not found on BLM land in the study area and none of the plants have been found on BLM land. A discussion of the status of these plants is not included in this text because none were located in the study area on land administered by the BLM.

Lupinus montigenus Heller Muhlenbergia 6:109, 1910

Common name: None

Description: Perennial, stems simple, several to many from a thick rootstock, 3 dm. high, pubescent with white, somewhat appressed hairs, and apparently puberulent beneath these, leafy: basal leaves few, their petioles 1.5 dm. long, those of the stem leaves successively shorter, the uppermost 1 to 2 cm. long, pubescent like the stems; leaflets about 9, densely white villous, narrowly lanceolate, 3 cm. long, 4 mm. wide, acute or short acuminate; peduncles short, 3 to 4 cm. long; inflorescence rather loose, 1 dm. long or less; bracts lanceolate, acuminate, 6 mm. long, 3mm. wide at base, persistent, densely white villous, as are the pedicels and calyx; pedicels 4 mm. long; calyx with a lanceolate bractlet at the base on either side which sometimes protrudes above the sinus; lobes nearly equal, the upper 7 mm. long, cleft into lanceolate, acute divisions, with practically no sinus, the edges of the divisions almost touching; lower lobe 8 mm. long, shortly 3-toothed; flowers violet-blue, 12 mm. long, 10 mm. deep, distance between apices of banner and wings about 4 mm; banner with the sides turned back and parallel, a space of about 4 mm. between the edges, the face yellowish or whitish, a little more than half its length concealed by the wings, the free portion with a narrow groove, the banner nearly orbicular when spread out, 12 mm. across the middle; wings rather broadly inflated, open and loosely inclosing the keel, 6 mm. deep, not strongly curved dorsally; keel not strongly curved, violet toward the rather thick apex, the margins ciliate except at the very base and apex, 4 mm. deep at the middle.

Flowering time: April-August

Location: Washoe Co., Toiyabe National Forest

Habitat: Gravelly ridges and alpine fellfields at 9000-10,950 feet

Vegetation type: Pinus albicaulis

Geology: Unknown

Population observations: Not available

Land Status: Private, USFS

General distribution: Washoe, Carson City, and Clark Counties in Nevada; also in California

Status: Reviewed as threatened (Federal Register 1975)

Draba stenoloba Ledeb. var. ramosa C.L. Hitchc. University
of Washington Publications in Biology 2:102. 1941

Common name: None

Description: Plants annuals (?) biennials or short-lived perennials with simple (usually) or branched caudices; leaves mostly basal and less than 25 in number, obovate to oblanceolate, 10-40 mm. long, (3-) 4-8mm. broad, denticulate usually, hispidulous with rather long simple to once- or twice-forked hairs; stems simple or branched, 5-30 (-40) cm. tall, sparingly strigose to stellate below, glabrous above, with from 1 to 8 ovate leaves, these but slightly smaller than the basal ones, entire to denticulate; racemes 10-30 flowered (secondary racemes with as few as 3-4 flowers), rather lax, mostly equal to or longer than rest of stem; pedicels usually equal to or longer than silicles, glabrous; sepals ca. 1.5 (1-2.25) mm. long, pilose; petals mostly ca. 3 (2-4.5) mm. long, spatulate, emarginate to rounded, yellow to cream-colored, often fading to white; silicles linear to linear-oblong, acute, 8-12 (-22) mm. long, 1.5-2.3 mm. broad, glabrous (pubescent in rare cases); styles lacking or but ca. 0.1 mm. long; seeds 16-40, 0.8-1 mm. long. Leaves rather densely pubescent with simple or forked hairs; lower pedicels longer than silicles; silicles evenly and finely short pubescent; stems branched from most of the leaf axils.

Flowering time: June-August

Location: Washoe Co., Toiyabe National Forest

Habitat: Subalpine forests and alpine fellfields at 7000-10,000 feet

Vegetation type: Red Fir and Yellow Pine Forests

Geology: Unknown

Population observations: Not available

Land Status: Private, USFS

General distribution: Washoe and Douglas Counties in Nevada; also in California.

Status: Reviewed as threatened (Federal Register 1975)

Rorippa subumbellata Roll.

Common name: None

Description: Perennial with slender underground rootstocks; stem decumbent, branched, hirsute, 5-18 cm. long; lvs. short-petioled to sessile, subpinnatifid, pilose to glabrous, 1-3 cm. long, 3-10 mm. wide; infl. subumbellate to somewhat elongate; pedicels erect to divaricate, 3-6 mm. long; sepals 2-3 mm. long; petals somewhat longer; siliques broadly oblong to subglobose, glabrous, 3-5 mm. long; styles 1-1.5 mm. long; seeds tawny, beaded, slightly over 1 mm. long.

Flowering time: June-July

Location: Douglas Co., Toiyabe National Forest

Habitat: Moist places-sandy granitic soil at shore of Lake Tahoe, 6,000-8,000 feet.

Vegetation type: Unknown

Geology: Unknown

Condition: Unknown

Population observations: Not available

Land status: Private, USFS

General distribution: Douglas County Nevada and in California

Status: Reviewed as threatened (Federal Register 1975)

Draba asterophora Payson var. asterophora Am. Journ. Bot.
4:263; 1917.

Common name: None

Description: A diffuse caespitose perennial, the vegetative branches prostrate; leaves in basal rosettes and on short sterile branches, obovate, 5-12 mm. long, 2-7 mm. broad, rather thick and firm, finely pubescent with stellate or cruciform, stalked hairs, scapes numerous, 3-8 cm. tall, often stellate on lower third, otherwise glabrous, as is the entire inflorescence; racemes simple, 10-25 flowered, in fruit usually equal to or longer than peduncle; pedicels from slightly shorter to somewhat longer than fruits; sepals 2-3 mm. long, glabrous or slightly pilose; petals yellow, 4-6 mm. long; silicles ovate-elliptic to nearly oval, flat, 5-13 mm. long, 3-6 mm. broad, the valves thick and leathery, glabrous (minutely soft stellate); styles 0.25-2 mm. long; seeds 4-10, the body of seed nearly 2 mm. long, nearly surrounded by a thin wing ca. 0.5 mm. broad.

Flowering time: July-August

Location: Washoe Co., Toiyabe National Forest

Habitat: In rock crevices and talus at 8,000-10,500 feet

Vegetation type: Sub-alpine fir, lodgepole pine forest, and alpine fellfields

Geology: Unknown

Condition: Unknown

Population observations: Not available

Land status: Private, USFS

General distribution: Washoe County Nevada and in California

Status: Reviewed as threatened (Federal Register 1975).

Eriogonum anemophilum Greene Pittonia 3(27):199-214. 1897.

Common Name: None

Description: Low, caespitose, the short branches of the caudex woody and very leafy, the whole herbage somewhat softly but densely white-tomentose: leaves obovate to suborbicular, a half-inch long or less, obtuse, some abruptly tapering to the petiole, this about a half-inch long: scapes erect from a slightly decumbent base, mostly about 3 inches high, bearing a rather large terminal cluster of crowded involucre, these, even to their short erect teeth or lobes, embedded in a looser white wool: perianths cream-color, fading reddish, rather broad, not stipitately narrowed, deeply cleft, the segments broad throughout, somewhat, quadrate-obovate, obtuse or emarginate: filaments and ovary glabrous.

Flowering time: July-August

Location: Washoe Co., Toiyabe National Forest

Habitat: Limestone outcrops at 9,000-9,500 feet

Vegetation type: Yellow Pine, Red Fir, and alpine fellfields.

Geology: Unknown

Condition: Unknown

Population observations: Not available

Land Status: Private, USFS

General distribution: Washoe, Lincoln, and Pershing Counties in Nevada.

Status: Reviewed as endangered (Federal Register 1975).

Draba lemmonii S. Wats. var. incrassata Rollins Rhodora
55:324.

Common name: None

Description: Cespitose perennial, spreading by decumbent stems; lvs. basal, tufted, thickish, obovate to oblanceolate, 5-20 mm. long, 2-7 mm. wide, hirsute on both surfaces and ciliate with stiff simple or once-forked hairs, also rather stiffly hirtellous; scapes leafless, 2-12 cm. tall, hirsute with simple or branched hairs; pedicels hirsute, equaling silicles; sepals ca. 2.5 mm. long; petals yellow, 4-6 mm. long; silicles oval to lance-ovate; mostly hirsute, 5-10 mm. long, 2.5-5 mm. wide, usually curved or contorted; styles 0.5-1 mm. long; seeds 4-16, ca. 1-1.5 mm. long. Scapes, pedicels and silicles glabrous; lvs. hairy on margins only and with simple hairs.

Flowering time: July-August

Location: California thought to occur in Lake Tahoe-Mt Rose region.

Habitat: Gravelly slopes, talus, and crevices at 8,500-13,000 feet.

Vegetation type: Subalpine fir and alpine fellfields

Geology: Unknown

Population observations: Unknown

Land Status: Unknown

General distribution: Mono County California, listed for Nevada as probable occurrence.

Status: Reviewed as threatened (Federal Register 1975)

Haplopappus eximus Hall Univ. Calif. Pub. Bot. 6:170, 1915.

Common name: None

Description: A perennial herb, 0.3 to 1.5 dm. high, with numerous erect or ascending stems crowded on the summit of a slightly woody underground caudex and also from deepseated rhizomes, inclined to form loose mats of considerable extent; stems green, glandular-puberulent, clothed at base with remains of the previous year's foliage; leaves narrowly to broadly spatulate, erect, saliently dentate above middle, obtuse, mucronate, 2 to 5 cm. long (including the petiole-like base), 3 to 15 mm. or rarely up to 20 mm. wide, with 1 strong and 2 fainter nerves from base, these branching in the blade to form large areoles, both faces with short gland-tipped hairs; heads solitary, terminal, usually subtended by 1 or 2 reduced leaves; involucre hemispheric, 8 to 10 or rarely 15 mm. high, 8 to 10 mm. broad; bracts not imbricated, all much shorter than disk, very unlike, the outer broadly oblong or nearly obovate to oblanceolate, obtuse, mucronate, green and glandular-puberulent, the inner lanceolate, attenuate, minutely fimbriate on margin or smooth, scarious, reddish or pale, mostly glabrous; ray-flowers 15 to 20, the ligules about 8 mm. long; disk-flowers 40 to 80; disk-corolla very slenderly funnelform, 6 to 7 or 9 mm. long, the throat longer than tube, glabrous; lobes narrow, erect, about 1 mm. long, glabrous; style-branches short-exserted (about 2 mm. long), the thickish obtuse appendage about equaling stigmatic portion; achenes subcylindric, slightly compressed about 4 mm. long, faintly ribbed, densely pubescent; pappus equalling corolla, soft, sordid, rather scanty.

Flowering time: July-August

Location: Washoe Co., Toiyabe National Forest

Habitat: Gravel and rock on high ridges, rock crevices at 7,000-10,000 feet.

Vegetation type: Subalpine fir and alpine fellfields.

Geology: Unknown

Condition: Unknown

Population observations: Not available

Land status: Private, USFS

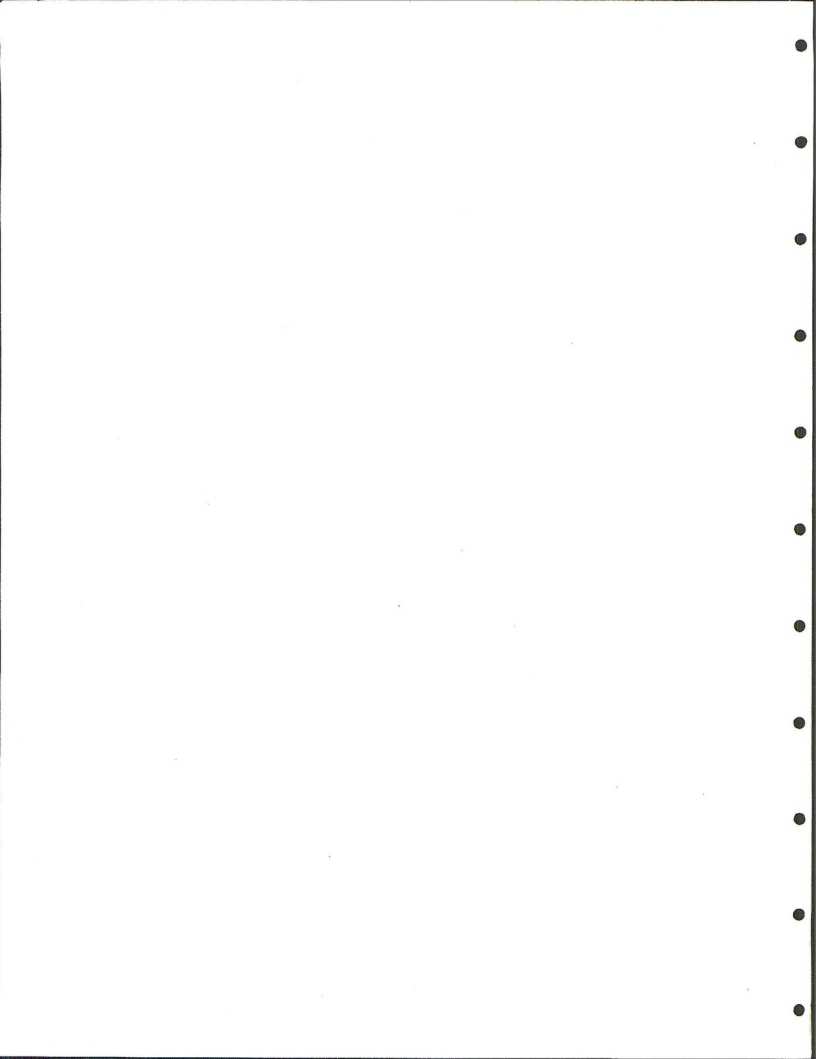
General distribution: Washoe County Nevada and in California.

Status: Reviewed as threatened (Federal Register 1975).

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